REMARKS

This is in full and timely response to the Office Action mailed April 23, 2003. Reexamination and reconsideration in light of the above amendments and the following remarks are respectfully requested.

By the foregoing amendment, claim 20 was amended to correct for dependency. Support for this amendment can be found variously throughout the specification, including for example, original claim 19. Claims 1-18 and 20 are currently pending for the Examiner's reconsideration, with claims 1, 14 and 16 being independent.

A.   Claim Objections

Claim 20 was objected to for depending from a cancelled claim. By this Amendment, claim 20 was amended to depend from independent claim 16. Withdrawal of this objection is requested.

B.   Rejections under 35 U.S.C. §103

1.   Claims 1-3, 5-6, 8 and 14

Claims 1-3, 5-6, 8 and 14 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,499,288 to Hunt et al. in view of U.S. Patent No. 6,535,600 to Fisher et al. Applicant respectfully traverses this rejection.

Claim 1 recites an automated call routing system that routes a telephone call by responding to a routing objective of a calling party, comprising: a speech recognizer that determines at least one phrase from a speech utterance made by the calling party and outputs a digital phrase; a topic identifier that receives the digital phrase and converts the digital phrase to at least one of a word stem and a word class and generates a topic output; and a maximum benefit router that receives the topic output and determines where to route the telephone call in order to optimize at least one predetermined parameter, said telephone call routed based on maximum benefit.

Claim 14 recites an automated call routing system that routes a call by responding to a routing objective of a calling party, comprising: a recognizer that determines at least one phrase made by the calling party and outputs a second phrase; a topic identifier that receives the second phrase and converts the second phrase to at least one of a word stem and a word class and generates a topic output; and a maximum benefit router that receives the topic output and determines where to route the call in order to optimize at least one predetermined parameter, said telephone call routed based on maximum benefit.

Hunt et al. '288 discloses a system for simultaneous voice recognition and verification of caller identification. A user is first prompted to speak a password, then each spoken digit is recognized using an independent voice recognition algorithm 48. The password is then verified by comparison 48 against a database 45 to determine if the password is valid. If the password is valid, the caller's identification is therefore verified.

In this manner, Hunt et al. '288 takes each spoken number as a "word", compares each "word" to a training database created from numerous test voices in order to determined what the spoken number is, then compares the series of numbers, or "words," a database of numbers having access to the system.

It is clear the Office Action has stretched the reference beyond its limitations. For example, the Office Action alleges that the Hunt et al. '288 disclosure of a simultaneous voice recognition and verification to allow access to telephone network services "reads on claimed "automated call routing system that routes a telephone call by responding to a routing objective of a calling party." Hunt et al. '288 clearly and unambiguously disclose a system for verifying a user access code by using voice recognition to allow a user to enter digits of a password, or, stated differently, allows a user access to the system. This is **not** responding based on routing objective as claims and described in applicant's specification.

Still further, the Office Action misinterprets various components of Hunt et al. '288. For example, the Office Action calls the voice verification algorithm 50 a topic identifier. However, the voice verification algorithm 50 "facilitates voice-controlled access to one or more services 20..." Col 2, line 67 to col. 3, line1. "The system uses the voice verification algorithm 50 to perform voice verification on the caller to determine if the entered password ... [is] a "match" ... [allowing] access

to the data or other system service...." Col 5, lines 6-12. If the access inquiry is rejected the call is terminated.

This is in direct contradiction to the topic identifier of the present invention, in which the topic identification program 28 looks up each resulting stemmed word or word class in a table of keywords that make up the features of a multinomial model. See, for example, paragraphs 41 -42.

Fisher et al. '600 discloses an automatic call routing system to route calls to available call center agents. "In the call center 101 are a set of call queues 120 and a set of agent queues 130. Each call queue 121-129 corresponds to a different agent skill as does each agent queue 131-139." See column 5, lines 28-31. Historically, calls are queued based on their order of priority or based on skill. Column 5, lines 31-36. A call vector program 140 "assigns incoming calls to different call queues 121-129 based upon the agent skill required for proper handling of the call" made to a call center 101. An "agent and call selector program 150 assigns available ones of agents 106-108 to agent queues 131-139 based upon the skills which they possess." Column 5, lines 48-50. That is, the agent and call vector program 150 "effects assignments between incoming calls and available agents in a manner to meet the business goals of the call center, typically to equalize the level of service to each skill." Column 5, lines 56-59.

The Office Action alleges that item 140 of Fisher et al. '600 is a maximum benefit router. This is incorrect. Fisher et al. '600 clearly discloses "automatically routing calls to call center agents in an agent surplus condition based on agent skill levels, where there is a measure of each agent's competence with a particular skill." Column 2, lines 37-40. A call vector program 140 "assigns incoming calls to different call queues 121-129 based upon the agent skill required for proper handling of the call" made to a call center 101. As depicted in Fig. 2-5, calls are routed to agents in an "agent surplus condition." See column 6, lines 3-6. The goal is to allow the call center manager to alter the idle time of agents who serve the "small job" pools. Column 6, lines 15-37. That is, agents can be held in reserve (and not assigned calls), making them available for the least requested, or most difficult assistance. This is known as an "agent surplus" condition. Fisher et al. '600 makes maximum use of the "agent surplus" but first determining the skill sets of each operator, and creating a paradigm whereby the variable traffic load of the call center can be directed to operators having the predetermined skill sets, and the operators having "specialized" skill sets are given "general" calls when they are idle. This results in increased performance metrics by, for

example, reducing the wait time for a caller, while maximizing utility of the operators (reduced agent surplus). See, for example, column 2, lines 36-59. Accordingly, Fisher et al. '600 takes <u>calls already routed by customer objective</u> and **assigns an operator/agent to the call based on the operator's skill set**. Thus, Fisher et al. '600 does not determine where to route a call based on maximum benefit.

As stated in Applicant's previous response, in contrast, claims 1 and 14 both require a maximum benefit router that receives the topic output and determines where to route the call in order to optimize at least one predetermined parameter, said telephone call routed based on maximum benefit. As disclosed in the specification, for example, at paragraph [0010], a maximum benefit router

> routes telephone calls based on the caller's goals and/or the benefit of routing callers to a customer care center most appropriate for retrieving a valid answer for the caller. In general, the cost or benefit is based on the fastest and least expensive way to answer a query posed by a caller. Using a probabilistic model of the caller's goals or call-topics based on a response to a top-level prompt, and a set of functions associating a utility or benefit with routing those call-topics to destinations within the center, the utility or benefit is measured according to a measurable criteria such as agent time saved. The invention selects the destination for each call that will have the maximum expected benefit. Stated simply, for example, when a caller has a question about billing, the call is best routed to a person who has special knowledge about billing, and most likely can answer the billing question in the shortest amount of time. If the billing question was routed to a person having special knowledge about, for example, installation, it most likely would take more time to answer a billing question, and the answer might not be as accurate. In this manner, questions about billing are routed to a person best equipped to answer the question according to the measured criteria, thereby freeing up a specialist that can answer installation questions from another call inquiring about installation.

Accordingly, claims 1 and 14 clearly claim a maximum benefit router that routes telephone calls based on maximum benefit.

Accordingly, the maximum benefit router, and the routing of telephone calls based on maximum benefit, is not disclosed, taught or suggested by Fisher et al. '600.

Since Fisher et al. '600 does not disclose, teach or suggest the claimed maximum benefit router, Fisher et al. '600 does not make up for the acknowledged deficiencies of Hunt et al. '288, and a prima facie case of obviousness has not been established by the examiner. Withdrawal of this rejection is respectfully requested.

Regarding claim 2, the Office Action acknowledges that Hunt et al. '288 and Fisher et al. '600 fail to disclose that the maximum benefit router determines the best routing objective of the calling party according to call topics. See Office Action at page 4, lines 12-13. However, as discussed above, Fisher et al. '600 discloses the assignment of operators, not the routing of calls based on maximum benefit. Accordingly, Fisher et al. '600 do not make up for the deficiencies of Hunt et al. '288, and a prima facie case of obviousness has not been established by the examiner. Withdrawal of this rejection is respectfully requested.

Regarding claim 3, the Office Action acknowledges that Hunt et al. '288 and Fisher et al. '600 fail to disclose that the maximum benefit router determines the best routing destination based on the routing objective of the calling party distinguished from a second routing objective of a call center. See Office Action at page 5, lines 1-3. However, as discussed above, Fisher et al. '600 discloses the assignment of operators, not the routing of calls based on maximum benefit. Accordingly, Fisher et al. '600 do not make up for the deficiencies of Hunt et al. '288, and a prima facie case of obviousness has not been established by the examiner. Withdrawal of this rejection is respectfully requested.

Regarding claim 5, the Office Action acknowledges that Hunt et al. '288 and Fisher et al. '600 fail to disclose a "having at least one routing destination and at least one caller topic." See Office Action at page 5, lines 13-15. However, claim 5 recites "a benefit matrix as input to the maximum benefit router, said benefit matrix having at least one routing destination and at least one caller topic." The Office Action incorrectly alleges that a benefit matrix is taught in Fisher et al. '600 at column 5, lines 45-61. No such benefit matrix is disclosed, taught or suggest anywhere in Fisher et al. '600. As discussed above, Fisher et al. '600 discloses the assignment of operators, not the routing of calls based on maximum benefit. Accordingly, there can be no benefit matrix as input to a maximum benefit router. Accordingly, Fisher et al. '600 do not make up for the deficiencies of Hunt et al. '288, and a prima facie case of obviousness has not been established by the examiner. Withdrawal of this rejection is respectfully requested.

Regarding claim 6, the Office Action acknowledges that Hunt et al. '288 and Fisher et al. '600 fail to disclose a "topic identifier generates a topic likelihood vector." See Office Action at page 6, lines 4-5. However, claim 6 recites "the topic identifier generates a topic likelihood vector

that is input to the maximum benefit router." The Office Action incorrectly alleges that a topic identifier generates a topic likelihood vector that is input to the maximum benefit router is taught in Fisher et al. '600 at column 5, lines 45-61. No such topic identifier that generates a topic likelihood vector is disclosed, taught or suggest anywhere in Fisher et al. '600. As discussed above, Fisher et al. '600 discloses the assignment of operators, not the routing of calls based on maximum benefit. Accordingly, Fisher et al. '600 do not make up for the deficiencies of Hunt et al. '288, and a prima facie case of obviousness has not been established by the examiner. Withdrawal of this rejection is respectfully requested.

Regarding claim 8, the Office Action acknowledges that Hunt et al. '288 and Fisher et al. '600 fail to disclose a "routing the telephone call to a first call center based upon optimized response quality." See Office Action at page 6, lines 13-15. However, claim 8 recites "the maximum benefit router routes the telephone call to a first call center based upon at least one of optimized time savings, optimized cost savings, optimized response quality and optimized resources." As discussed above, Fisher et al. '600 discloses the assignment of operators, not the routing of calls based on maximum benefit. Accordingly, Fisher et al. '600 do not make up for the deficiencies of Hunt et al. '288, and a prima facie case of obviousness has not been established by the examiner. Withdrawal of this rejection is respectfully requested.

Still further, claims 2-3, 5-6 and 8, being dependent upon claim 1, are also allowable for the reasons above. Moreover, these claims are further distinguished by the materials recited therein, particularly within the claimed combination. Withdrawal of the §103(a) rejection is therefore respectfully solicited.

2. Claims 4, 7 and 15

Claims 4, 7 and 15 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,499,288 to Hunt et al. in view of U.S. Patent No. 6,535,600 to Fisher et al., and further in view of U.S. Patent No. 6,269,153 to Carpenter et al. Applicant respectfully traverses this rejection.

Carpenter et al. '153 discloses methods and apparatus for call routing whereby a caller's response to a routing question is used to direct the call to a destination, and storing and processing caller contributions to each call. If the caller's response does not allow for unambiguous routing, the

routing system poses clarifying questions to the caller, and these additional responses are used to refine the query for use in a subsequent attempt to rout the call. The primary objective of Carpenter et al. '153 is to eliminate ambiguity of the caller's routing request in order for the routing module to be able to route the call appropriately.

As the Examiner has withdrawn the previous rejections using Carpenter et al. '153, it is de facto acknowledgment by the Patent Office that Carpenter et al. '153 do not disclose, teach or suggest a maximum benefit router. Accordingly, Carpenter et al. '153 do no not make up for the deficiencies of Hunt et al. '288 and Fisher et al. '600, and a prima facie case of obviousness has not been established by the examiner. Withdrawal of this rejection is respectfully requested.

Still further, claims 4 and 7, being dependent upon claim 1, and claim 15, being dependent upon claim 14, are also allowable for the reasons above. Moreover, these claims are further distinguished by the materials recited therein, particularly within the claimed combination. Withdrawal of the §103(a) rejection is therefore respectfully solicited.

3.   Claims 9 and 10

Claims 4, 7 and 15 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,499,288 to Hunt et al. in view of U.S. Patent No. 6,535,600 to Fisher et al., and further in view of U.S. Patent No. 5,794,192 to Zhao. Applicant respectfully traverses this rejection.

Zhao '192 discloses an apparatus and method for improving speech recognition. Zhao '192 does not disclose, teach or suggest a maximum benefit router.

The Office Action at page 10, lines 14-16 alleges that Zhao '192 teaches that "the maximum benefit router optimizes ..." This is clearly incorrect. The Office Action reference to Zhao '192 is ONLY to a discussion of Bayesian estimation, which is all Zhao '192 can be applied, as Zhao '192 does not disclose, teach or suggest a maximum benefit router. Accordingly, Zhao '192 does no not make up for the deficiencies of Hunt et al. '288 and Fisher et al. '600, and a prima facie case of obviousness has not been established by the examiner. Withdrawal of this rejection is respectfully requested.

Still further, claims 9 and 10, being dependent upon claim 1, are allowable for the reasons above. Moreover, these claims are further distinguished by the materials recited therein, particularly

within the claimed combination. Withdrawal of the §103(a) rejection is therefore respectfully solicited.

4.   Claims 11 and 16

Claims 11 and 16 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,499,288 to Hunt et al. in view of U.S. Patent No. 6,535,600 to Fisher et al., and further in view of U.S. Patent No. 6,233,555 to Parthasarathy et al. Applicant respectfully traverses this rejection.

Claim 16 recites a method for automatically routing a telephone call using maximum benefit routing, comprising the steps of: receiving a telephone call from a caller; determining phrases from speech utterances by a caller; inputting said determined phrases to a speech recognizer device; converting said recognized determined phrases into at least one of word stems and word classes; performing keyword lookup on the one of word stems and word classes; generating a feature vector that contains the number of times the at least one word stems and word classes were found in the determined phrase; performing analysis on the feature vector; outputting a posterior possibilities vector; inputting the posterior possibilities vector and determining the expected benefit of routing the call to each of a predetermined destination; and outputting a benefit sorted vector of destinations, benefits and topic scores.

Parthasarathy et al.'555 discloses, and is applied, for disclosing a speaker identification method and apparatus for determining the identification of a speaker based on utterances. Parthasarathy et al.'555 does not disclose, teach or suggest maximum benefit routing. Accordingly, Parthasarathy et al.'555 does no not make up for the deficiencies of Hunt et al. '288 and Fisher et al. '600, and a prima facie case of obviousness has not been established by the examiner. Withdrawal of this rejection is respectfully requested.

Still further, claim 11, being dependent upon claim 1, is also allowable for the reasons above. Moreover, this claim is further distinguished by the materials recited therein, particularly within the claimed combination. Withdrawal of the §103(a) rejection is therefore respectfully solicited.

5.　　　Claims 12 and 13

Claims 12 and 13 are rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,499,288 to Hunt et al. in view of U.S. Patent No. 6,535,600 to Fisher et al., and further in view of U.S. Patent No. 6,295,533 to Cohen. Applicant respectfully traverses this rejection.

Cohen '533 discloses a system and method for accessing heterogeneous databases. The system is used to answer queries concerning information stored in the database. Cohen '533 does not disclose, teach or suggest maximum benefit routing as recited in the claims, rather, this reference is applied solely for disclosing a Porter stemming algorithm. Cohen '533 does not make up for the deficiencies of Hunt et al. '288 and Fisher et al. '600, and a prima facie case of obviousness has not been established.

Still further, claims 12 and 13, being dependent upon claim 1, is also allowable for the reasons above. Moreover, this claim is further distinguished by the materials recited therein, particularly within the claimed combination. Withdrawal of the §103(a) rejection is therefore respectfully solicited.

6.　　　Claim 17

Claim 17 is rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,499,288 to Hunt et al. in view of U.S. Patent No. 6,535,600 to Fisher et al., in view of U.S. Patent No. 6,233,555 to Parthasarathy et al., and further in view of U.S. Patent No. 5,625,748 to McDonough et al. Applicant respectfully traverses this rejection.

McDonough et al. '748 discloses a topic discriminator having an integrated speech recognizer or word or phrase spotter as part of a speech event detector, along with a topic identifier. McDonough et al. '748 does not disclose, teach or suggest maximum benefit routing as recited in the claims, rather, this reference is applied solely for speech analysis. McDonough et al. '748 does not make up for the deficiencies of Hunt et al. '288 and Fisher et al. '600 and Parthasarathy et al.'555, and a prima facie case of obviousness has not been established.

Still further, claim 17, being dependent upon claim 16, is also allowable for the reasons above. Moreover, this claim is further distinguished by the materials recited therein, particularly

within the claimed combination. Withdrawal of the §103(a) rejection is therefore respectfully solicited.

7.   Claim 18

Claim 18 is rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,499,288 to Hunt et al. in view of U.S. Patent No. 6,535,600 to Fisher et al., in view of U.S. Patent No. 6,233,555 to Parthasarathy et al., and in view of U.S. Patent No. 5,625,748 to McDonough et al., and further in view of U.S. Patent No. 6,269,153 to Carpenter et al.   Applicant respectfully traverses this rejection.

As discussed above, the Examiner has withdrawn the previous rejections using Carpenter et al. '153, and it is de facto acknowledgment by the Patent Office that Carpenter et al. '153 do not disclose, teach or suggest a maximum benefit router.   Accordingly, Carpenter et al. '153 do no not make up for the deficiencies of Hunt et al. '288 and Fisher et al. '600 and Parthasarathy et al.'555 and McDonough et al. '748, and a prima facie case of obviousness has not been established by the examiner. Withdrawal of this rejection is respectfully requested.

Still further, claim 18, being dependent upon claim 16, is also allowable for the reasons above. Moreover, this claim is further distinguished by the materials recited therein, particularly within the claimed combination. Withdrawal of the §103(a) rejection is therefore respectfully solicited.

8.   Claim 20

Claim 20 is rejected under 35 U.S.C. §103(a) as being unpatentable over U.S. Patent No. 5,499,288 to Hunt et al. in view of U.S. Patent No. 6,535,600 to Fisher et al., in view of U.S. Patent No. 6,233,555 to Parthasarathy et al., and further in view of U.S. Patent No. 6,269,153 to Carpenter et al.   Applicant respectfully traverses this rejection.

As discussed above, the Examiner has withdrawn the previous rejections using Carpenter et al. '153, and it is de facto acknowledgment by the Patent Office that Carpenter et al. '153 do not disclose, teach or suggest a maximum benefit router.   Accordingly, Carpenter et al. '153 do no not

make up for the deficiencies of Hunt et al. '288 and Fisher et al. '600 and Parthasarathy et al.'555, and a prima facie case of obviousness has not been established by the examiner. Withdrawal of this rejection is respectfully requested.

Still further, claim 20, being dependent upon claim 16, is also allowable for the reasons above. Moreover, this claim is further distinguished by the materials recited therein, particularly within the claimed combination. Withdrawal of the §103(a) rejection is therefore respectfully solicited.
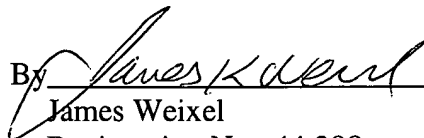
C.   <u>Conclusion</u>

All rejections having been addressed, it is respectfully submitted that the present application is in condition for allowance, and a Notice to that effect is earnestly solicited.

It is believed that any additional fees due with respect to this paper have already been identified. However, if any additional fees are required in connection with the filing of this paper, permission is given to charge account number 07-2339.

Dated: _7/22/2003_   Respectfully submitted,

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